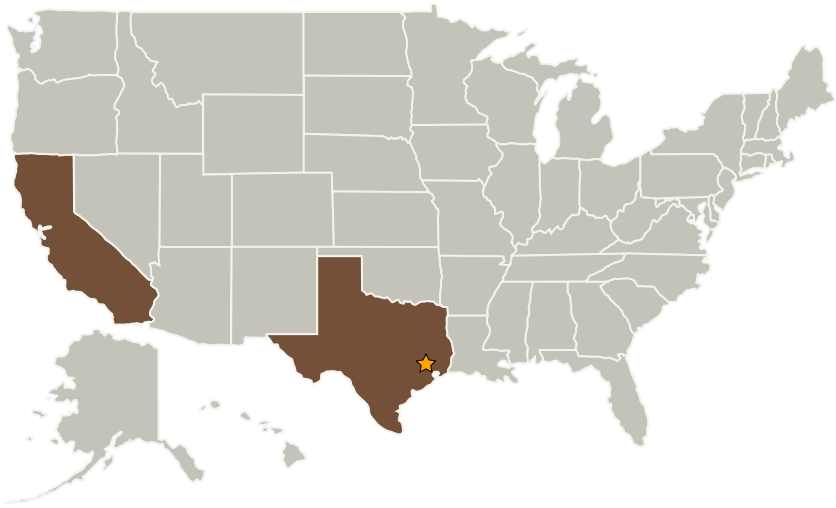
Earth Virtual-Environment Immersive Scene Display System, Phase I

Completed Technology Project (2005 - 2005)

Project Introduction

In response to the NASA need for a free-standing immersive virtual scene display system interfaced with an exercise treadmill to mimic terrestrial exercise experience in space, Physical Optics Corporation (POC) proposes to develop a new Earth Virtual-environment Immersive Scene (EVIS) display system based on omnidirectional image projection and a wraparound multiplexed holographic collimating projection screen. A single unique, high-resolution omnidirectional wraparound image projector projects continuous wraparound imagery onto thin, curved, three-color-(RGB)-multiplexed holographic optics, which collimate the projected light into a virtual image. EVIS will thus display a greater than 180 degree (up to full 360 degree) free-standing FOV of flowing virtual earth scene to a crew member on a treadmill. Without multiple projectors, bulky optics, or a tiled screen, EVIS will be compact, lightweight, and power-efficient. It is producible at low cost by integrating commercially available microdisplays for the omnidirectional projector and by mass producing the multiplexed holographic collimating screen by means of established POC technologies. In Phase I POC will design in detail an EVIS display system for a treadmill, and fabricate a proof-of-concept model to demonstrate feasibility. Phase II will focus on optimizing both the material technology and components so that a fully operational prototype is completed.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Physical Optics Corporation	Supporting Organization	Industry	Torrance, California

Primary U.S. Work Locations	
California	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Tin Aye

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.2 Extravehicular Activity Systems
    - TX06.2.3 Informatics and Decision Support Systems